**WHAT IS CLAIMED IS:**

1. An apparatus for packet scheduling using a credit based round robin in a high-speed communication network in which packets are transmitted to and received from a plurality of connections having allocated bandwidths of service, comprising:

a packet pool for storing input packets;

a token queue for storing tokens each having a connection identifier (ID) of an input packet stored in said packet pool, the round number (RN) of the connection, and a credit value (CV) for service; and

a connection management unit for transmitting the input packets to said packet pool, reading the packets stored in said packet pool, generating the tokens each having a connection identifier (ID) of an input packet stored in said packet pool, the round number (RN) of the connection, and a credit value (CV) for service and transmitting them to said token queue, and servicing the packets of said packet pool designated by the token stored in said token queue.

2. The apparatus according to claim 1, wherein said token queue is serviced in a first-in, first-out manner.

3. The apparatus according to claim 1, wherein said credit value (CV) for service, which is set on said token, is a HOL packet credit value of said token queue.

4. The apparatus according to claim 1, wherein said connection management unit sets weight W for each connection and sets said weight W as an available credit AC; produces and transmits to said token queue a token having a corresponding connection identifier (ID), the round number (RN) of the connection, and the credit value (CV) of the size of the packet if a packet of a size less than said set available credit (AC) arrives; produces and transmits to said token queue a token having a corresponding connection identifier (ID), the round number (RN) of the connection, and the available credit (AC) as the credit value (CV) if the packet of a size larger than said set available credit (AC) arrives and a difference between the size of the packet and the available credit AC is less than the weight (W); and produces and transmits to said token queue a token having a corresponding connection identifier (ID), the round number (RN) of the connection, and the weight (W) as the credit value (CV) if the packet of a size larger than said set available credit (AC) arrives and a difference between the size of the packet and the available credit (AC) is larger than the weight (W).

5. The apparatus according to claim 4, wherein the available credit (AC) is reset to {the available credit (AC) - the size of the packet} and the round number (RN) is reset to 0 if the packet of a size equal to or less than said set available credit (AC) arrives; and the residual size of HOL packet (RSP) is reset to {the size of the packet - the available credit (AC)}, the round number (RN) is set to 1 and then the available credit (AC) is reset to 0 if the packet of a size larger than said set available credit (AC) arrives and a difference between the size of the packet and the available credit AC is equal to or less than the weight (W); and the round number (RN) is reset to $\lceil$ {the size of the packet - the available credit (AC) -1}/the weight (W) $\rceil$, the residual size of HOL packet (RSP) is reset to {the size of the packet - the available credit (AC) - (the round number (RN) - 1) × the weight (W)} and then the available credit (AC) is reset to 0 if the packet of a size larger than said set available credit (AC) arrives and a difference between the size of the packet and the available credit (AC) is larger than the weight (W).

6. The apparatus according to claim 1, wherein the token is not produced and the next tokens wait to be added, if the available credit (AC) is less than the weight (W) and the size of the HOL packet (SP).

7. The apparatus according to claim 1, wherein said connection management unit manages parameters of a connection identifier (ID), a weight (W), an available credit (AC), the size of HOL packet (SP), a confirmed credit (CC), a backlog size of the packet (BS), and the residual size of the packet (RSP).

8. The apparatus according to claim 1, wherein said connection management unit has at least one token for the same connection and services the packets in the order of arrival in a range of the available credit (AC).

9. A method for packet scheduling using a credit based round robin in a high-speed communication network for receiving a plurality of packets arrived at a network switch from a plurality of the connection having a respective service rate and transmitting the packets to a communication link, comprising:

a first step of setting weight (W) proportional to a service rate for each of the connections and setting said weight as available credit (AC);

a second step of receiving and storing at least one input packet;

a third step of generating a token having a connection identifier (ID) of the input packet of the connection, round number (RN) of the connection and a credit value (CV) for

service, according to the result of the comparison of the size (SP) of the received input packets with the size of the available credit (AC) and storing the token in a token queue if the residual size (RSP) of a HOL packet of each connection stored is 0; and

a fourth step of servicing the stored packet designated by the token stored in the token queue.

10. The method according to claim 9, wherein said token queue is serviced in a first-in, first-out manner.

11. The method according to claim 9, wherein said third step comprises:

a fifth step of determining whether the available credit (AC) is equal to or larger than the size of the input packet (SP);

a sixth step of setting the credit value (CV) of a corresponding connection to the size of the packet (SP), setting the round number (RN) to 0 so that the corresponding connection is set, and resetting the available credit (AC) to (the AC - the SP), if the available credit (AC) is equal to or larger than the size of input packet (SP) as the result of the determination at said fifth step;

a seventh step of comparing a value (SP -AC) derived by subtraction of the available credit (AC) from the size of the packet (SP) with the weight (W), if the available credit (AC)

is less than the size of input packet (SP) as the result of the determination at said fifth step;

an eighth step of setting the credit value (CV) of a corresponding connection to the available credit (AC), setting the round number (RN) to 1 so that the token of the corresponding connection is set, and setting the value of (SP -AC) to the residual size of the packet (RSP), if the value of (SP -AC) is equal to or less than the weight (W) as the result of the comparison at said seventh step; and

a ninth step of setting the credit value (CV) of the corresponding connection to the available credit (AC) and setting the round number (RN) to ⌈(the SP - the AC - 1)/the W ⌉ so that the token of the corresponding connection is set and resetting the residual size of the packet (RSP) to {the SP - the AC - (the RN - 1) × the W}, if the value of (SP -AC) is larger than the weight (W) as the result of the comparison at said seventh step.

12. The method according to claim 11, wherein parameters of a connection identifier (ID), a weight (W), an available credit (AC), the size of the HOL packet (SP), a confirmed credit (CC), a backlog size of the packet (BS) and the residual size of the packet (RSP) are managed for each connection and reset based on the size of input packets (SP).

13. The method according to claim 11, wherein, tokens next to current token wait for inputted tokens having credits less than the weight (W) and are added without immediate setting of the current token, if the size of the packets (SP) is less than the confirmed credit (CC) at the time of receiving and outputting the packets and the residual size of HOL packet (RSP) is larger than 0.

14. The method according to claim 9, wherein, if at least one token is set for the same connection, the packets are serviced in the order of arrival in a range of the available credit (AC).

15. The method according to claim 9, wherein, at said fourth step, the HOL packet of a corresponding connection designated by a HOL token is serviced.

16. The method according to claim 9, wherein said third step further comprises:

a tenth step of servicing the HOL packet, if the size of the HOL packet of the stored input packets is equal to or less than the credit value (CV) set in the HOL token, and otherwise adding the credit value (CV) to a confirmed credit (CC) and storing credit amounting to the available credit (AC) in the token queue again; and

an eleventh step of assigning the available credit (AC) of a required amount and storing the token of the corresponding connection in the token queue, if the backlogged packet (BS) of the corresponding connection is present or a new packet arrives after the HOL packet is serviced.

17. The method according to claim 9, wherein the round number (RN) is set to (RN - 1) and stored in the token queue if the round number (RN) of the HOL token is larger than 1 at the time of outputting the packets, RN is set to 0 and CV is set to a smaller one of the weight (W) and the backlog size (BS) and stored in the token queue if RN is equal to 1, and a confirmed credit (CC) is compared with the size of the HOL packet and serviced if RN is equal to 0.

18. A computer readable recording medium in which a program is recorded for executing a method for packet scheduling using a credit based round robin in a high-speed communication network in which packets are transmitted to and received from a plurality of connections having allocated service rates, comprising:

a first step of setting weight (W) proportional to a service rate for each of the connections and setting said weight as available credit (AC);

a second step of receiving and storing at least one input packet;

a third step of generating a token having a connection identifier (ID) of the input packet of the connection, a round number (RN) of the connection and a credit value (CV) for service, according to the result of the comparison of the size (SP) of the received input packets with the size of the available credit (AC) and storing the token in a token queue if the residual size (RSP) of a HOL packet of each connection stored is 0; and

a fourth step of servicing the stored packet designated by the token stored in the token queue.